



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

SIGNAL WARRANTS ANALYSIS

LOCATION: I94 & CSAH 19 S RAMPS

COUNTY: WASHINGTON

REF. POINT: 251.676

DATE: 11/7/1995

OPERATOR: DR

Speed	Approach Description	Lanes
55	Major App1: WOODBURY DR/CSAH 19 WB, S OF S RAMPS OI	3
55	Major App3: WOODBURY DR/CSAH 19 SB, N OF S RAMPS OF	3
30	Minor App2: I94 EB RAMP TO WOODBRY DR/CSAH 19	3
0	Minor App4: N/A	0

0.70 FACTOR USED? YES

POPULATION < 10,000? NO

EXISTING SIGNAL ? NO

HOUR	420/630			140/70			0/0		MET SAME HOURS
	MAJOR APP. 1	MAJOR APP. 3	TOTAL 1+3	WARRANT MET	MINOR APP. 2	MINOR APP. 4	WARRANT MET APP. 2	WARRANT MET APP. 4	
0:00 - 1:00	36	6	42	/	28	0	/	/	/
1:00 - 2:00	10	5	15	/	13	0	/	/	/
2:00 - 3:00	5	2	7	/	13	0	/	/	/
3:00 - 4:00	2	3	5	/	7	0	/	/	/
4:00 - 5:00	12	4	16	/	10	0	/	/	/
5:00 - 6:00	80	18	98	/	29	0	/	/	/
6:00 - 7:00	375	125	500	X/	254	0	X/X	/	X/
7:00 - 8:00	578	114	692	X/X	196	0	X/X	/	X/X
8:00 - 9:00	287	101	388	/	211	0	X/X	/	/
9:00 - 10:00	177	111	288	/	217	0	X/X	/	/
10:00 - 11:00	176	115	291	/	261	0	X/X	/	/
11:00 - 12:00	235	136	371	/	337	0	X/X	/	/
12:00 - 13:00	269	134	403	/	290	0	X/X	/	/
13:00 - 14:00	279	147	426	X/	296	0	X/X	/	X/
14:00 - 15:00	280	145	425	X/	334	0	X/X	/	X/
15:00 - 16:00	409	184	593	X/	450	0	X/X	/	X/
16:00 - 17:00	374	217	591	X/	602	0	X/X	/	X/
17:00 - 18:00	331	187	518	X/	710	0	X/X	/	X/
18:00 - 19:00	227	102	329	/	338	0	X/X	/	/
19:00 - 20:00	149	76	225	/	224	0	X/X	/	/
20:00 - 21:00	128	72	200	/	153	0	X/X	/	/
21:00 - 22:00	96	52	148	/	102	0	/X	/	/
22:00 - 23:00	45	28	73	/	81	0	/X	/	/
23:00 - 24:00	36	15	51	/	44	0	/	/	/

	Met (Hr)	Required (Hr)	
Warrant 1	7	8	Not satisfied
Warrant 2	1	8	Not satisfied
Warrant 6	10	8	Satisfied, check accident record
Warrant 8	4	8	Not satisfied
Warrant 9	10	4	Satisfied
Warrant 11	3	1	Satisfied

LOCATION: I94 & CSAH 19 S RAMPS

COUNTY: WASHINGTON

REF. POINT: 251.676

DATE: 11/7/1995

OPERATOR: DR

0.70 FACTOR USED? YES
 POPULATION < 10,000? NO
 EXISTING SIGNAL ? NO

Speed	Approach Description	Lanes
55	Major App1: WOODBURY DR/CSAH 19 WB, S OF S RAMPS OF	3
55	Major App3: WOODBURY DR/CSAH 19 SB, N OF S RAMPS OF	3
30	Minor App2: I94 EB RAMP TO WOODBRY DR/CSAH 19	3
0	Minor App4: N/A	0

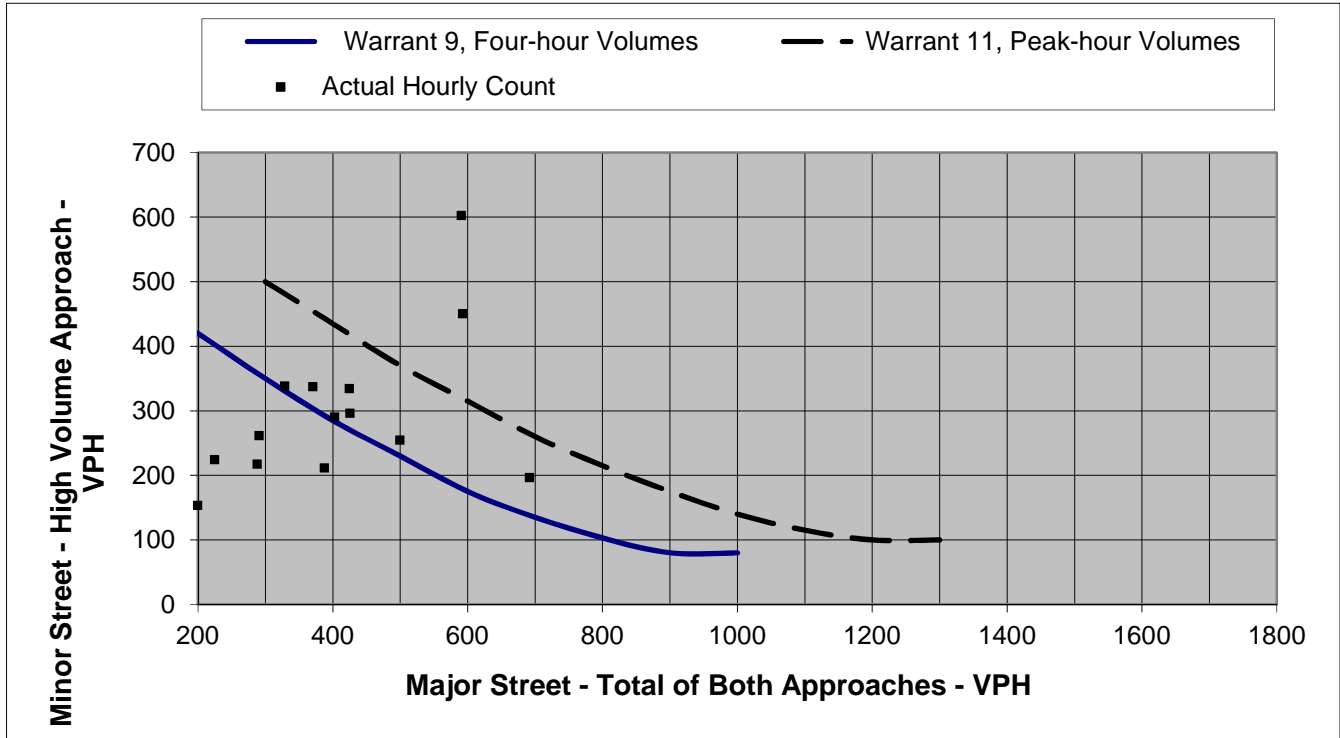


Figure 1. Four Hour and Peak Hour Warrant Analysis

Note: For data points outside the graph range, check the minor street volume against the lower thresholds

Major	Warrant Criteria		Actual Hourly Count	
	Warrant 9, F	Warrant 11, P	Major	Actual Hourly Count
200	420		42	28
300	350	500	15	13
400	285	435	7	13
500	230	370	5	7
600	175	315	16	10
700	135	260	98	29
800	103	215	500	254
900	80	175	692	196
1000	80	140	388	211
1100		115	288	217
1200		100	291	261
1300		100	371	337
1400			403	290
1500			426	296
1600			425	334
1700			593	450
1800			591	602
			518	710
			329	338
			225	224
			200	153
			148	102
			73	81
			51	44

Four Hour Warrant

Major App	Minor App		
	1 & 1	2 & 1	2 & 2
300	360	440	590
400	310	390	530
500	260	340	460
600	215	290	390
700	180	245	330
800	150	205	280
900	125	170	235
1000	100	145	195
1100	85	120	165
1200	80	100	135
1300	80	83	110
1400	80	80	110

Peak Hour

Major App	1 & 1
400	475
500	425
600	370
700	330
800	280
900	240
1000	204
1100	175
1200	150
1300	130
1400	115
1500	100
1600	100
1700	100
1800	100

Four Hour Warrant Factored

Major App	Minor App		
	1 & 1	2 & 1	2 & 2
200	250	320	420
300	210	265	350
400	170	215	285
500	130	170	230
600	93	130	175
700	70	100	135
800	60	80	103
900	60	65	80
1000	60	60	80

Peak Hour

Major App	1 & 1
300	320
400	270
500	225
600	180
700	145
800	115
900	90
1000	75
1100	75
1200	75
1300	75

Warrant

Minor App

2 & 1	2 & 2
570	725
520	665
465	600
420	540
370	480
330	425
285	375
250	330
220	285
190	250
160	220
140	187
115	165
100	150
100	150

Warrant Factored

Minor App

2 & 1	2 & 2
380	500
335	435
285	370
240	315
200	260
160	215
135	175
110	140
95	115
75	100
75	100



MINNESOTA DEPARTMENT OF TRANSPORTATION

METRO DIVISION - TRAFFIC ENGINEERING

ALL WAY STOP WARRANT

LOCATION: I94 & CSAH 19 S RAMPS

COUNTY: WASHINGTON

REF. POINT: 251.676

DATE: 11/7/1995

OPERATOR: DR

Speed	Approach Description	Lanes
55	Major App1: WOODBURY DR/CSAH 19 WB, S OF S RAMPS (3
55	Major App3: WOODBURY DR/CSAH 19 SB, N OF S RAMPS C	3
30	Minor App2: I94 EB RAMP TO WOODBRY DR/CSAH 19	3
0	Minor App4: N/A	0

0.70 FACTOR USED? Yes

HOUR	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	350	140	WARRANT MET
					TOTAL Σ (APP.1 to APP. 4)	MINOR TOTAL APP. 2 + APP. 4	
0:00 - 1:00	36	6	28	0	70	28	/
1:00 - 2:00	10	5	13	0	28	13	/
2:00 - 3:00	5	2	13	0	20	13	/
3:00 - 4:00	2	3	7	0	12	7	/
4:00 - 5:00	12	4	10	0	26	10	/
5:00 - 6:00	80	18	29	0	127	29	/
6:00 - 7:00	375	125	254	0	754	254	X/X
7:00 - 8:00	578	114	196	0	888	196	X/X
8:00 - 9:00	287	101	211	0	599	211	X/X
9:00 - 10:00	177	111	217	0	505	217	X/X
10:00 - 11:00	176	115	261	0	552	261	X/X
11:00 - 12:00	235	136	337	0	708	337	X/X
12:00 - 13:00	269	134	290	0	693	290	X/X
13:00 - 14:00	279	147	296	0	722	296	X/X
14:00 - 15:00	280	145	334	0	759	334	X/X
15:00 - 16:00	409	184	450	0	1043	450	X/X
16:00 - 17:00	374	217	602	0	1193	602	X/X
17:00 - 18:00	331	187	710	0	1228	710	X/X
18:00 - 19:00	227	102	338	0	667	338	X/X
19:00 - 20:00	149	76	224	0	449	224	X/X
20:00 - 21:00	128	72	153	0	353	153	X/X
21:00 - 22:00	96	52	102	0	250	102	/
22:00 - 23:00	45	28	81	0	154	81	/
23:00 - 24:00	36	15	44	0	95	44	/

Met (Hr) Required (Hr)

Allway Stop Warrant: **15** 8 **Satisfied**

REMARKS: _____
